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## Journal of the Society of Arts.

FRIDAY, JULY 27, 1866.

### Announcements by the Council.

#### EXAMINATIONS, 1867.

The Programme of Examinations for next year is in preparation, and will shortly be ready for issue.

### Proceedings of Institutions.

BIRMINGHAM (MESSRS. CHANCE'S LIBRARY AND READING ROOM).—This Institution maintains a good average state of prosperity. The number of members for 1864 was 178, and for 1865 it was 172 per quarter. The reading room and library are open from nine in the morning till ten at night. The subscription is one shilling per quarter. The first subscription of one shilling constitutes membership, and entitles the member to all the privileges of the Institution. The penny entertainments, which were commenced in the winter of 1864, have been a popular feature of the work of the Institution. Seven were given in the winter of 1864-5, and four others in the latter part of 1865. The proceeds of one of these was given towards the funds of the South Staffordshire Educational Association, a fee of 6d. being charged to a portion of the room. Upon several occasions the music given has been of a very superior order, and upon all occasions the audience has been most attentive and enthusiastic. The thanks of the community are greatly due to those ladies and gentlemen who have contributed so liberally to the interest of the entertainments, by their excellent readings and music. It has not been a design to make them a source of profit, but it is satisfactory to know that they have paid their way. The expenses of refreshments, railway fares, and other incidental expenses, are considerable, and the engagement of professional assistance is now rendered necessary by the difficulty of securing a sufficiently large and constant supply of local talent. This increased expenditure has been met by a necessary increase in the rate of admission to one portion of the school room. The receipts in 1864 amounted to £39 19s. 1d., and the expenses to £34 8s. 6d. In 1865 the receipts were £44 7s. 5d., while the expenses were £39 4s. 7d. This statement of receipts is exclusive of the librarian's salary, expense of repairs, coals, and gas, which are the annual contribution of the Messrs. Chance to the library and reading room. The library was, in 1864, enlarged to the extent of £25 from the same source. The receipts for the eleven entertainments given during 1864 and 1865 were £21 12s. 6d., and the expenses were nearly as great, the balance in hand being £1 12s. 3d.

#### EXAMINATION PAPERS, 1866.

The following are the Examination Papers set in the various subjects at the Society's Final Examinations, held in April last:—

(Continued from page 579).

#### ELECTRICITY AND MAGNETISM.

THREE HOURS ALLOWED.

1. State the direction of the lines of magnetic force between the poles of a bar-magnet, and the means of observing them.

2. What is the nature of magnetic force? Can it properly be called an attractive force? Give an experimental proof of your answer.
3. What elements of the earth's magnetism have been observed and recorded, and by what instruments?
4. How may the errors of a ship's compass be ascertained and corrected?
5. Describe the peculiar magnetic properties of *bismuth*, and mention other bodies possessing similar properties.
6. Explain the two kinds of free electricity, and the means of distinguishing between them.
7. Describe the action of an insulated electrified body on other bodies near, but not in contact with it.
8. Explain the different effects produced when a *point* or a *knob* is presented to an electrified body; and apply this principle to the construction of a lightning conductor.
9. How is a voltaic current produced? What actions occur in any given element of a battery?
10. What forms of battery are preferred for (a) uniformity, (b) durability, and (c) intensity of current?
11. Describe some of the processes employed in electro-metallurgy.
12. What means have been adopted for testing the insulation of a submarine cable in the course of construction?
13. Explain the construction of a Morse printing telegraph.
14. Explain Wheatstone's "bridge," and its application in discovering a *fault* in a circuit.
15. What must be the relative directions of two currents, that one may rotate round the other? Explain the cause of the rotation.
16. Describe the construction of a thermo-electric pile, and the form generally adopted in experiments on radiant heat.
17. Describe the electric organs of the torpedo.
18. In what kind of animals do manifestations of electric force continue longest after death? How may a battery be constructed of dead animal tissue?

#### LIGHT AND HEAT.

THREE HOURS ALLOWED.

#### GEOMETRICAL OPTICS.

1. State the law of the intensity or brightness of light, at different distances, from a luminous origin of light. Show how this law is employed in photometry to find the relative brightness of lights, describing some form of a photometer, and the mode of using it. If a gas flame at 10 feet distance gives an equal illumination on a screen with a lighted candle at 4 feet, what is the illuminating power of the gas light compared with that of the candle.
2. When an image of an object is formed by a *convex spherical mirror*, show that it is always *virtual*, *erect*, and *diminished*. Show how a convex mirror is employed in Cassegrain's telescope, and show how it then furnishes a *real* secondary image of the distant object towards which the telescope is directed.
3. Explain how the prismatic spectrum is formed when a beam of light passes through a refracting prism. State the circumstances to be attended to in order to obtain a pure prismatic spectrum. What are meant by Fraunhofer's fixed lines of the solar spectrum?
4. Explain the causes of long and short-sightedness, and show the forms of the lenses required to correct them respectively. When the eye views an image of an object through a single convex lens, as a simple microscope, show how the magnifying power arises, and find an expression for it.

#### PHYSICAL OPTICS.

5. Enunciate the law of the ordinary refraction of light by transparent media, and name some media for which it holds good, both crystallized and uncryallized. Describe the nature of the refraction in the crystals called *uniaxal* crystals, and also in those called *biaxal* crystals.

6. Describe the construction of a simple polariscope made with pieces of window glass. Show the properties of the reflection at transparent surfaces on which it acts, and describe the experiments which may be tried with it.

7. Show how the property of interference of light is demonstrated by the experiment with the two mirrors slightly inclined, or the obtuse-angled prism. Explain how interference proves the property of periodicity in light, and show how the luminiferous interval can be measured for any given colour.

8. Describe the apparatus required for showing the rings and brushes seen in polarized light around the optic axes of uniaxial crystals. Show the circumstances when the black and bright brushes are seen respectively. Describe also the appearance when the light is either *circularly* polarized or *circularly* analyzed.

#### HEAT.

9. Explain what is meant by radiant heat, and state the properties which it possesses in common with light. Describe an experiment which shows that the amount of radiation from the surface of a heated body depends greatly on the state of the surface.

10. Describe the construction of the differential air thermometer, and show the advantages it possesses in certain cases. State some experimental investigations where it would be more useful than a common thermometer.

11. Explain what is meant by the specific heat of bodies, and describe the method of finding it for solid bodies by the method of immersion. The specific heat of water being taken as unity, what are the specific heats of iron, silver, and lead?

12. Show how the elastic force of vapours can be determined when less than that of the atmosphere. Describe the construction and mode of action of the old atmospheric pumping engine. What were its disadvantages?

#### CHEMISTRY.

##### THREE HOURS ALLOWED.

*No candidate is allowed to answer more than three questions in each division.*

##### FIRST DIVISION.

1. Describe by an equation the action of hydrated sulphuric acid on manganese bioxide. What weight of the bioxide would be needed for the preparation of a kilogramme of oxygen? Mn. = 55; O = 16.

2. The equation  $fe^3 + (H^2 O)^4 = fe^3 O^4 + H^8$  represents the action of steam on red-hot iron. What weight of iron is thus oxidized by the decomposition of 9 kilogrammes of steam? fe = 56; H = 1.

3. 500 cubic centimetres of pure and dry air were measured off at  $0^{\circ} C$ , and 760 millimetres barometric pressure, and mixed with 250 cubic centimetres of hydrogen under like conditions. What will be the volume of the residue after explosion, and what its per-centage composition?

4. What volume of oxygen is needed for the combustion of a litre of sulphuretted hydrogen? What volume of sulphurous acid is formed?

5. Describe and explain the manufacture of phosphorus from bone earth. How is red phosphorous prepared from clear phosphorus.

6. How would you separate silica from the other constituents of felspar, viz. alumina and potash.

##### SECOND DIVISION.

7. A solution acid to test paper is precipitated black by the action of sulphuretted hydrogen. How would you examine the precipitate for the detection of the metals contained in it?

8. A strongly alkaline liquid forms a white precipitate by the action of hydric sulphate ( $H^2 SO^4$ ). Chlorine forms a brown precipitate in the original solution. The brown precipitate is soluble in strong hydrochloric acid with evolution of chlorine and formation of a crystalline chloride. What would you suspect the

original liquid to have contained, and how would you test it?

9. Describe the ordinary process for the manufacture of metallic lead, and the separation of silver from lead.

10. What compounds of manganese are there analogous respectively to compounds of calcium, iron, sulphur, and chlorine? How do these compounds decide the atomic weight of manganese, its equivalent weight being previously known?

11. Describe by equations the following reactions, viz., I., the precipitation of argentic nitrate (nitrate of silver), by hydro-di-sodic-phosphate (common phosphate of soda). II. The action of strong hydrochloric acid in excess on potassic dichromate (red chromate of potash). III. The action of sulphuretted hydrogen on bismuthic chloride.

12. How is magnesia prepared? How metallic magnesia? Describe the chief reactions of the salts of magnesia.

##### THIRD DIVISION.

13. How is pure alcohol obtained from sugar?

14. Describe the preparation of pure benzole? What is its composition? How much heavier than hydrogen is its vapour? What does commercial benzole usually contain?

15. Describe by an equation the action of litharge and water on stearine.

16. What is the meaning of the term amide? Describe the formation and chief properties of acetamide, oxamide, and carbamide.

17. What are the constituents of coal gas? How could you prove the presence of each of them in the gas?

18. The silver salt of an organic acid yielded by combustion 114 per cent. of carbonic acid and 42 per cent. of water. It was also found to contain 55.95 per cent. of silver. Calculate the formula of the salt.

*(To be continued.)*

#### MUSIC IN ENGLAND.

BRIEF NOTES ON MUSIC IN ENGLAND FROM THE TIME OF THE ANGLO-SAXONS TO THE COMMENCEMENT OF THE 18TH CENTURY, AND THE AID AFFORDED BY THE CROWN, &c., TO ITS SUPPORT.

*(Continued from page 584).*

##### EDWARD VI.

In Burney's General History of Music, vol. iii., pp. 4, 5, and 6, is an account of the musical establishments of the Household and Chapel Royal in the reign of Edward the Sixth, with the names of the musicians, their instruments and fees. The names of the officers and gentlemen of the "Chappell," are also given with their fees.

##### MUSITIONS AND PLAYERS.

	Fee.
	£ s. d.
Trumpeters:—	
Sejeante, Benedict Browne .....	24 6 8
Trumpeters, in No. 16, every of them having by the yere £24 6s. 8d.....	389 6 8
Luters—Philip Van Welder and Peter Van Welder .....	40 0 0
Harpers { William Moore ..	18 5 0
Bernard de Ponte .....	20 0 0
Singers—Thomas Kent and Thomas Bowde, £9 2s. 6d. each .....	18 5 0
Rebecke—John Seuernicke .....	24 6 8
Sagbuts. In number six, whereof five havinge £24 6s. 8d. by the yere, and one at £36 10s.	158 3 4
Vyalls. In number 8, whereof 6 at £30 8s. 4d. the yere, and one at £2, and another at £18s. 5s.....	220 15 0
Bagpiper—Richard Woodward .....	12 3 4
Minstrilles. In number 9, wherof 7 at £18 5s. a-piece .....	127 15 0
,, 1 at £24 6s. 8d., and 1 at £3 6s. 8d.	27 13 4

Dromslades (? drum-beaters). In number 3, whereof Robert Bruer, master drummer Alexander Pencax and John Hodgkin, £18 5s. a-piece .....

18 5 0

Players on the Flutes { Oliver Rampons ....  
Pier Guye .....

36 10 0

{ John Heywoode.....

18 5 0

Players on Virginals { Anthony de Chouinte  
Robert Bewman.....

34 8 4

50 0 0

30 8 4

12 3 4

NOTE.—The Virginal is a keyed instrument of one string, jack, and quill, to each note, like a spinet, but in shape resembling the present small piano-forte (1789). It has been imagined to have been invented in England during the reign of Queen Elizabeth, and to have been thus denominated in honour of that virgin princess; but we have here not only a proof of its use in this kingdom before she was queen, but a drawing and description of it appeared in Luscinius's "Musurgia" before she was born.

Musitions	The four brethren Venetians, viz.:—John, Anthonye, Jasper, and Baptiste.....	16 6 8
Straungers.	Augustine Bassane.....	36 10 0
	William Trosses and William Deniuat .....	76 0 0
Players of Interludes,	in number 8, every of them at £3 16s. 8d. by yere.....	26 13 4
Camera 7, £23 6s. 8d; in scaccario £3 6s. 8d.		
Makers of Instruments.	{ William Beton, organ-maker William Tresor, regal-maker	20 0 0
		10 0 0
	Summa totalis .....	£1,732 0 0

Total number of persons, 73.

## OFFICERS OF THE CHAPPELL.

Master of the children, Richard Bowyer, Fee  
Largess to the children at high feasts.....  
Allowance for breakfast for the chidre .....

Gentlemen of the chappell, 32, every of them

7d. ob. a day :—

Emery Tuukfield, Robt. Chamberley, Willm. Barber, John Bendebowe, Robt. Morecock, Richd. Ayleworth, Thos. Falfreymen, Richd. Farrant, John Kye, John Angel, Wm. Huchins, Nich. Archibald, Willm. Graueend, Robt. Richmounte, Willm. Mawpley, Robt. Phelps, Thomas Birde, Robt. Perry, Thos. Wayte, Thos. Talles, Thos. Wright, Robt. Stone, William Walker, Richd. Bowyer, Nich. Millowe, George Edwards, J. Shepparde, Wm. Hynnes, or Hunnes, Thos. Maune, Roger Kenton, Lucas Caustell, Edward Addams.....  
Two at 4d. ob. a day either of them; five at  
4d. the day every of them; Hugh Wil-  
liams at 40s. a yere .....

40 0 0
9 13 4
16 0 0

365 0 0

46 2 1

Summa totalis..... £476 15 5

The number of boys (children) in the chapel is not given.

The sum total of the annual fees paid to the two establish-  
ments amounts to £2,208 15s. 5d., being for the "Mu-  
sicians and Players," £1,732, and for the "Officers of the  
Chappell," £476 15s. 5d. The number of persons was 73  
musicians, and 41 officers of the chapel. The authority  
for these details is stated by Burney to be a MS. in the  
British Museum, but he does not give a reference to it.

It was during the reign of Edward VI. that metrical  
Psalmody became general in the parish churches in  
England.

On the 19th June, 1547, a "dirige" was sung at St. Paul's, and other churches in London, for the death of Francis I., and on the next day the Archbishop of Canterbury sang a

mass, or requiem, in the choir of St. Paul (Heylin. *Ecclesiastical History*); and in September of the same year the Litany was sung in the English tongue in the same Cathedral, Bishop Bonner being in the Fleet prison.

The "compline" being part of the evening prayer, a kind of final chorus, was sung in English in the King's Chapel, in the year 1547, before any Act of Parliament enjoined it. (Burney.)

## QUEEN MARY.

By a record in the possession of the Society of Antiquaries, it appears that the chapel establishment of this Queen was pretty much on the same scale as that of her brother Edward. She was herself a performer on the lute and virginals. Ecclesiastical music during her reign was again done with Latin words; but the science does not seem to have made much progress during the period that she was on the throne.

## QUEEN ELIZABETH.

Choral music and music generally was much practised and cultivated during the long and prosperous reign of Queen Elizabeth. The Queen was very fond of music, and accustomed to sing and play on the lute, virginals, &c. Sir James Melvil gives an amusing account of a conversation he had with her in 1564, when ambassador from Mary Queen of Scots :—“ After her Majesty had asked him how his Queen was dressed? What was the colour of her hair? Whether that or hers was best? Which of them two was fairest? and which of them was highest in stature? Then she asked, what kind of exercise she used? I answered, says Melvil, that when I received my dispatch the Queen was lately come from the Highland hunting; that when her more serious affairs permitted she was taken up with reading of histories; that sometimes she recreateth herself in playing upon the lute and virginals. She asked if she played well? I said, ‘ reasonably for a Queen.’ ”

“ The same day, after dinner, my Lord of Hunsden drew me up to a quiet gallery, that I might hear some musick (but he said that he durst not avow it), where I might hear the Queen play upon the virginals. After I had hearkened awhile, I took by the tapestry that hung before the door of the chamber, and seeing her back was toward the door, I entered within the chamber and stood a pretty space, hearing her play excellently well. But she left off immediately, so soon as she turned about and saw me. She appeared to be surprised to see me, and came forward, seeming to strike me with her hand; alledging she used not to play before men, but when she was solitary, to shun melancholy. She asked how I came there? I answered, as I was walking with my Lord Hunsden, as we passed by the chamber door, I heard such a melody as ravished me, whereby I was drawn in ere I knew how; excusing my fault of homeliness, as being brought up in the court of France, where such freedom was allowed, declaring myself willing to endure what kind of punishment her Majesty should be pleased to inflict upon me for so great offence. Then she sat down low upon a cushion, and I upon my knees by her; but with her own hand she gave me a cushion to lay under my knee, which at first I refused, but she compelled me to take it. She enquired whether my queen or she played the best. In that I found myself obliged to give her the praise.” (Burney, Vol. 3, p. 14.)

Burney says that if the Queen was able to execute any of the pieces in a MS. which goes by the name of *Queen Elizabeth's Virginal Book*, she must have been a very great player. It has been imagined, too, that Elizabeth was a performer on the violin, and also on an instrument something like a lute, but strung with wire, and called the “ poliphant,” or “ polyphon.” A violin, of singular construction, with the arms of England and the crest of Dudley, Earl of Leicester, engraved on it, was purchased at the sale of the late Duke of Dorset's effects; the date of its make, 1578. It is very curiously carved, but the several parts are so thick and loaded with ornaments

that it has not more tone than a mute, or violin with a sordine; and the neck, which is too thick for the grasp of the hand, has a hole cut in it for the thumb of the player, by which the hand is so confined as to be rendered incapable of shifting, so that nothing could be performed on "this instrument but what lies within reach of the hand in its first position. The instrument is at present the property of Mr. Bremner, music printer, in the Strand. It is from the arms and crest that are engraved upon it that conjecture has made Queen Elizabeth its original possessor." (Burney, Vol. 3, p. 15, 16.)

The musical instrument thus described by Dr. Burney is now in the possession of the Earl of Warwick, and may be seen in the Loan Court of the South Kensington Museum, the Earl having sent it there for public exhibition.

Among the Sloane collection of MSS. preserved in the British Museum, there is one (No. 1,520) which contains a list of the musical establishment of Queen Elizabeth about the year 1587. It is as follows:—

MUSYTYONS.			
The servant (fee) .....	£24	6	8
Trompeters, 16, fee to every of them .....	24	6	8
LUTES, HARPS, AND SINGERS.			
Chief luter (fee) .....	40	0	0
Chief harper .....	20	0	0
Rest of the luters .....	19	0	0
The other of two harps .....	9	0	0
And .....	8	0	0
Bagpiper (fee) .....	12	13	4
Minstrels, 9, whereof 7 at .....	18	5	0
One at .....	24	6	0
And the other at .....	66	0	8
Six children to sing.			
Rebeck, 2 (fee) .....	28	6	6
Sackbut, 6, whereof 5 having by the year ...	24	6	8
And one at .....	36	10	0
Vials, 8, whereof 6 at .....	30	8	4
One at .....	20	0	0
And thother at .....	10	0	0
Players on the virginals, 3, one at .....	50	0	0
And thother 2, at a piece .....	30	0	0
Musitions straungers, 7, whereof 6 have .....	30	10	0
And one .....	38	0	0
Drumsleds, 3, every of them .....	18	5	0
Players on the flute, 2, at a piece .....	18	5	0
Makers of instruments { Regal maker .....	20	0	0
Organ maker .....	20	0	0
Players of interludes, 8, every of them per annum .....	66	0	8

The Chapel establishment was nearly the same as that which existed in the previous reigns of Mary and Edward the Sixth.

Neal, in his *History of the Puritans* (p. 156), says that the service of her (Queen Elizabeth's) chapel was not only sung with organs, but with other instruments, such as cornets, sackbuts, &c., on festivals. In 1599 she published injunctions for the clergy, in the 49th of which there is one for choral music (Heylin, *Ecclesiast. Hist.*, p. 289).

In the Chapter-house at Windsor there is the following warrant of Queen Elizabeth:—

ELIZ. R. Whereas our Castle of Windsor hath of old been well furnished with singing men and children—We, willing it should not be of less reputation in our days, but rather augmented and increased, declare that no singing men or boys shall be taken out of the said chapel by virtue of any commission, not even for our household chapel. And we give power to the bearer of this to take any singing men or boys from any chapel, our own household and St. Paul's only excepted. Given at Westminster the 8th day of March, in the second year of our reign.—ELIZABETH R.

The prosperous reign of Queen Elizabeth was perhaps not rendered more illustrious by the musical productions

of Tallis, Bird, and Morley, than the performance of Dr. John Bull, whose abilities on the organ and virginal seem to have been truly wonderful. This great musician was born about 1563, in Somersetshire; in 1591 was appointed organist of the Chapel Royal; and in 1596, at the recommendation of her Majesty, had the honour of being the first that was appointed music-professor to Gresham College; and though unable to compose and read his lectures in Latin, according to the founder's original intention, such was his favour with the Queen, that the executors of Sir Thomas Gresham, by two ordinances bearing date 1597, dispensed with his knowledge of the Latin language, and ordered, "The solemn musick lecture to be read twice every week, in manner following, viz.: the theoretique part for one half-hour or thereabouts, and the pratique, by concert of voice or instruments, for the rest of the hour, whereof the first lecture should be in the Latin tongue, and the second in English. But because at this time Mr. Doctor Bull, who is recommended by the Queen's most excellent Majesty, being not able to speak Latin, his lectures are permitted to be altogether in English, so long as he shall continue in the post of lecturer there." (Burney, vol. iii., p. 106.)

Instrumental music was, however, in a very low state during this reign. Henxner, in his *Itinerarium*, says that she (Queen Elizabeth) used to be regaled during dinner "with 12 trumpets and 2 kettle-drums, which, together with fifes, cornets, and side-drums, made the hall ring for half-an-hour together."

Vocal music had made great advances; and the church music, madrigals, and songs in parts of our countrymen during that reign, may bear comparison with the best contemporary productions of the continent. (Burney.)

#### JAMES I.

Antheums, masques, songs, madrigals, and catches seem to comprise the vocal music of this reign for the church, stage, and chamber. Instrumental music made but little advance. The king does not seem to have derived any pleasure from music, though the separate music establishments of himself and Prince Henry were kept up in good state. But no records appear to exist to prove that the court took any direct interest in promoting and encouraging music.

#### CHARLES I.

In the second year of this reign (1626), *Nicholas Laniere* was appointed Master of the King's Music. The charter appointing him may be found in Rymer's *Fœdera*, Vol. 18, p. 728, and is directed to the treasurer and under-treasurer of the Exchequer. It recites, "Whereas we have been graciously pleased, in consideration of service done and to be done unto us, by sundrie of our musicians, to graunt unto them the severall annuities and yearly pensions hereafter following (that is to say) to Nicholas Laniere, master of our musick, two hundred pounds yearly for his wages;" and to seventeen others (named) various annual sums, from twenty to eighty pounds a year.

The King constantly bestowed his attention and favour on the choral services of the church, and vocal music was greatly encouraged in his reign. But the court of Charles seems to have much indulged in the amusement of masques, in which music played a very important part. The four Inns of Court combined together and gave a masque of great magnificence to the King and his court at Whitehall during Christmas (1633). The cost of this masque to the four societies was upwards of £20,000.

In the eleventh year of his reign Charles I. granted a charter to the most eminent musicians of his time then living, incorporating them by the style and titles of "Marshal, Wardens, and Cominallie of the Arte and Science of Musick in Westminster." As before stated, the charter of the 9th of Edward IV. formed the groundwork and precedent of this of Charles I. The powers and privileges granted by it extended throughout England, the county Chester only excepted, and in favour of the ancient

claim of the Dutton family to sovereignty over the minstrels of that palatinate.

In 1643 the cathedral service was suppressed, and the art of music wholly discouraged. During the rebellion and interregnum, musicians who held offices and had employment about the Court were forced to skulk about the country, and solicit aid and an asylum from private patrons. (*Lurney*.)

#### MUSIC AT OXFORD DURING THE PROTECTORATE.

Anthony Wood, or à Wood, was born at Oxford in 1632. In his Life, written by himself, occurs the following:—"All the time that A. W. could spare from his beloved studies of English history, antiquities, heraldry, and genealogies, he spent in the most delightful facultie of musick, either instrumental or vocal; and if he had missed the weekly meetings in the house of W. Ellis, he could not well enjoy himself all the week after. Of all or most of the company, when he frequented that meeting, the names are set down under the year 1656. As for those that came in after, and were now performers, and with whom A. W. frequently played, were these:—Charles Perot, M.A., Fellow of Oriel Coll., a well-bred gentleman, and a person of a sweet nature; Christ. Harrison, M.A., Fellow of Queen's Coll., a maggot-headed person and humorous; Kenelm Digby, Fellow of Alls. Coll., he was afterwards Dr. of L., he was a violinist, and the two former violinists; Will. Bull, M.A., for the viol and violin; John Vincent, M.A., a violist; Sylvanus Taylor, Fellow of Allsoules Coll., violist and songster, his elder brother, Capt. Silas Taylor, was a composer of musick, played and sung his parts; Henry Langley, M.A., a violist and songster; Sam. Woodford, M.A., a violist; Franc. Parry, M.A., a violist and songster; Christ. Coward and Henry Bridgman, both Masters of Arts; Nathan Crew, M.A., a violinist and violist, but always played out of tune, as having no good ear, he was afterwards Bishop of Durham; Matthew Hutton, M.A., an excellent violist; Thom. Ken, of New Coll., afterwards Bishop of Bath and Wells, he would be sometimes among them and sing his part; Christ. Jefferyes, a junior student of Ch. Ch., excellent at the organ and virginals, or harpsicon, having been trained up to those instruments by his father, George Jefferyes, organist to King Charles I., at Oxon. Richard Rhodes, another junior student of Ch. Ch., a confident Westmonasterian, a violinist to hold between his knees.

"These did frequent the weekly meeting, and by the help of public masters of musick, who were mixed with them, they were much improved. Narcissus Marsh would come sometimes among them, but seldom played, because he had a weekly meeting in his chamber, where masters of musick would come, and some of the company before mentioned. When he became principal of St. Alban's Hall, he translated the meeting thither, and there it continued, when that meeting at Mr. Ellis's house was given over, and so it continued till he went over to Ireland, where he became afterwards Archbishop of Tuam. After his Majesty's restoration, when the masters of musick were restored to their several places that they before had lost, or gotten other preferment, the weekly meetings at Mr. Ellis's house began to decay, because they were only held up by scholars who wanted directors and instructors. So that these meetings were not continued above two or three years, and I think they did not go beyond 1662."

The Oxford annalist terminates his account of the musical transactions of the University during the Interregnum by this anecdote:—

"In Oct., 1659, James Quin, M.A., and one of the senior students of Ch. Ch., a Middlesex man borne, but son of Walter Quin, of Dublin, died in a crazed condition. A. W. had some acquaintance with him, and hath several times heard him sing with great admiration. His voice was a bass, and he had a great command of it. 'Twas very strong and exceeding trouling, but he wanted

skill, and could scarce sing in consort. He had been turned out of his student's place by the visitors; but being well acquainted with some great men of those times that loved musick, they introduced him into the company of Oliver Cromwell, the protector, who loved a good voice and instrumental musick well. He heard him sing with very great delight, liquored him with sack, and in conclusion said: *Mr. Quin, you have done very well, what shall I do for you?* To which Quin made answer with great compliments, of which he had command with a great grace, *that your highness would be pleased to restore him to his student's place*; which he did accordingly, and so kept it to his dying day."—*Burney*, vol. 3, pp. 428-30.

#### CHARLES II.

"The restoration of monarchy," says *Burney*, "and religious establishments drew from their retreats all the surviving musicians who had been degraded and involved in the calamities occasioned by the civil war."

In the year 1663 Charles II. augmented the salaries of the gentlemen of the Chapel to £70 a year, and granted £30 a year for the diet, lodging, washing, and teaching of the children of the Chapel Royal. Also "every gentleman of the Chapel in orders had allowed to him for a gown five yards of fine scarlet, and the rest of the gentlemen, being laymen, had allowed unto each of them four yards of the like scarlet." According to *Burney*, the reign of Charles II. was more favourable to the progress of our native church music than any other, except that of Queen Elizabeth.

The charter granted by Charles I. to the musicians of Westminster having lain dormant till the Restoration, the persons named in it, and still living, made an effort to re-establish its provisions, and rescue music "from the disgraces into which it had fallen." The Corporation hired a room in Durham-yard, in the Strand, and their first meeting was 22nd October, 1661, Nicholas Lanier being Marshal; from which day they proceeded to make orders, summoning, fining, and prosecuting all who dared to make any benefit or advantage of "Musique in England or Wales" without first taking out a license from their fraternity.

The original minutes of the proceedings of this corporation still exist and are preserved in the British Museum. (*Harleian MSS.*, No. 1911). The last entry is dated the 20th July, 1679, and is of a court holden at "ye 3 tunn taun;" "When," says *Burney*, "finding themselves involved in law-suits and incapable of enforcing the power they assumed and penalties they threatened, it was thought most advisable to leave the art and artists to the neglect or patronage of the public."

The succeeding reigns of James the Second, and William and Mary are not marked by any special advance in the support and progress of music, though remarkable as the period that produced Henry Purcell.

#### ROYAL ACADEMY OF MUSIC.

In 1720 a plan was formed for patronising, supporting, and carrying on Italian operas. A fund of £50,000 was raised by subscription, George the First giving £1,000. This plan or establishment was called the Royal Academy of Music, and consisted of a governor, deputy-governor, and 20 directors. The Duke of Newcastle was governor the first year, Lord Bingley deputy-governor, and the directors were the Dukes of Portland and Queensberry, the Earls of Burlington, Stair, and Waldgrave, Lords Chetwynd and Stanhope, Generals Dormer, Wade, and Hunter, Sir John Vanbrugh, Colonels Blathwayt and O'Hara, James Bruce, Thomas Cole, of Norfolk, Conyers D'Arcy, Bryan Fairfax, George Harrison, William Pulteney, and Francis Whitworth, Esqrs. "And in order to render this design as complete as possible, it was determined by the directors not only to engage a lyric poet in their service, but the best vocal performers that could be found in the several parts of Europe where there was a musical theatre, and the three most eminent composers then living who could be prevailed on to visit this country.

For this purpose Bononcini, as he tells us himself, had been invited hither from Rome; Altilio Ariosti, from Berlin; and Handel, who resided at this time with the Duke of Chandos, at Cannons, was not only included in this triumvirate, but commissioned to engage the singers. And with this view he went to Dresden, where the elector of Saxony, Augustus, then King of Poland, had Italian operas performed at his court in the most perfect and splendid manner possible; and here Handel engaged Senesino, Berenstadt, Boschi, and the Durastanti." (Burney, vol. iv., p. 258.)

The last opera performed under the auspices and direction of the Royal Academy of Music was *Ptolomeo (Tolomeo Re d'Egitto)*. The £50,000 originally subscribed for its support seems to have been sunk in less than seven years, besides the money obtained by the sale of tickets, and that taken at the doors for the admission of the general public.

Burney says that "the governor and directors of the Royal Academy of Music, after the sum originally subscribed for its support was expended, relinquished the idea of entering into new engagements for amusing the public at their own expense. Indeed, either from the difficulty of finding a sufficient number of subscribers that were willing to involve themselves in so costly and hazardous an enterprise, or from an opinion that the opera being no longer in an infant state, was now robust enough to go alone, it appears by the bills and advertisements that there were no annual subscribers in 1727, but its whole maintenance and support depended on the original subscribers and public favour. Whether the feuds which so long agitated the critics and patrons of music, concerning the abilities of Handel and Bononcini, and of Faustina and Cuzzoni, precipitated the dissolution of the Royal Academy, or the disagreement between Handel and Senesino, cannot now be easily determined. Perhaps all these causes conspired to relax discipline and to tire the public; for though zeal and attention were at first stimulated by these debates, yet they seem to have been succeeded by disgust and indifference. At the close of this season the whole band of singers dispersed, and the next year we find Senesino, Faustina, and Baldi performing in one theatre in Venice, and the Cuzzoni, with Nicolini, Farinelli, and Boschi, at another, in the same city.

"On the 15th of May a general court was summoned of all the subscribers to the Royal Academy of Music, and on the 16th notice was given in the same paper, 'that the general court of the Royal Academy of Music stands adjourned till eleven o'clock on Wednesday next, the 22nd instant, in order to receive any further proposals that shall be offered for carrying on the operas.' An other meeting, by adjournment, on the 29th. On the 31st 'the general court of the Royal Academy of Music stands adjourned till eleven o'clock on Wednesday the 5th of June next, in order to consider of proper measures for recovering the debts due to the Academy, and discharging what is due to performers, tradesmen, and others; and also to determine how the scenes, clothes, &c., are to be disposed of if the opera cannot be continued. N.B.—All the subscribers are desired to be present, since the whole will be then decided by a majority of votes.' Nothing further appeared in the newspapers concerning the Royal Academy of Music till December 2nd, when the following advertisement was inserted in the *Daily Courant*:—'The time appointed by the charter of the Royal Academy of Music for choosing a deputy-governor and directors of the said Academy being on the 22nd of November in each year, or within fourteen days after, notice is hereby given that a general court, by order of the governor of the said Academy, will be held at twelve o'clock on Friday next, being the 6th inst., at the usual place in the Haymarket.' Whether the court ever met, or any measures were taken in consequence of the advertisement, does not appear.

"In the autumn of this year, and the spring of the

next, the opera house was shut up, and the musical drama suffered to lie fallow."—*Burney*, vol. 4, pp. 337-9.

WILLIAM MATCHWICK.

#### THE NEW GRAND OPERA HOUSE OF PARIS.

The works of the new opera are proceeding gradually but sufficiently rapidly for the proposed inauguration, on New Year's Day, 1869. The sum said to be devoted to the purpose is one million sterling, of which three-fifths, if not more, have already been expended. It would perhaps be a little hazardous to say that there will not be required a certain postscript to the estimates. The employment of the twenty-five millions of francs is thus apportioned:—For iron work, two millions; marble, eight millions; sculpture, and other works of art, fifteen millions. Of course this is but a rough division.

The paintings in the interior are to be entrusted to MM. Baudry, Boulanger, Barrias, Delaunay, Gérôme, and Pils. It is said that the designs for these internal decorations, which have been submitted to the judgment of M. Garnier, the architect of the work, amount to several thousands in number.

The list of the statues and busts which are to decorate the exterior of the building and the vestibule is published officially. On the principal façade, in the tympana of the arcades of the main entrance will be medallions of the composers, Cimarosa, Pergolesi, Bach and Haydn. In the grand vestibule four seated statues of the four chiefs of the schools of Italy, France, Germany, and England—Lulli, Rameau, Gluck, and Handel.

In the seven *œils de bœuf*, or small circular windows, are to be seven bronze busts, gilt; the centre will be that of Mozart, born 1756, and those of the other composers will be placed on each hand according to the dates of their birth; thus to the right of Mozart will be Beethoven, born 1770; Auber, 1782; and Rossini, 1792; and on the left Spontini, 1774; Meyerbeer, 1794; and Halévy, 1799. On the return of the façade busts of two librettists—Quinault and Scribe. On the two lateral façades are to be placed twenty-four busts in chronological order. On one side Monteverde, Durante, Jomelli, Monsigny, Gretry, Sacchini, Lesueur, Berton, Boieldieu, Herold, Donizetti, and Verdi; on the other Cambert, Campra, Jean Jacques Rousseau, Philidor, Piccini, Parsiello, Cherubini, Méhul, Nicolo, Weber, Bellini, and Adam. In one of the foyers are to be placed busts of celebrated architects, or others connected with opera.

Amongst the sculptors employed are M. Carpeaux, whose fronton for the *Pavillon de Flora* of the Tuilleries has attracted so much well-deserved admiration, and which we have mentioned in our notes on the late Paris Salon, M. Denecheaux, and M. Bruyer.

Amongst the reports afloat respecting the decoration of the interior is one to the effect of M. Meissonnier having made proposals for departing from his micro-graphic style and executing colossal works on the walls of the salon in the rear of the Emperor's box. Another *on dit* is that this room will be so spacious that, in case of necessity the Emperor might give audiences, or hold a council of Ministers between the acts.

As regards the dimensions of the new opera house, the following are said to be exact. The stage is in all more than 165 feet in height, the space being divided equal between the stage proper and the spaces below and above, giving 55 feet to each. The size of the stage will be nearly 170 feet wide and about 114 deep. The principal boxes will have behind each an anti-chamber three times the size of the box itself; and the passages behind the boxes will be twenty feet wide. The immense importance of wide passages in theatres and all large public buildings, not only with respect to comfort and ventilation, but also as means of escape in case of fire or panic of any kind, cannot be too often insisted on. No one who contemplates building a new theatre,

especially for popular entertainments, should fail to visit the new Chatelet Theatre in Paris; the passages and lobbies of this beautiful theatre are large enough to drive a brougham along, and even in parts to turn it round, and the staircases are in keeping with these magnificent proportions. Another feature deserving attention in the same building is the fine public foyer, or saloon, with its terrace overlooking the Place du Chatelet and the Seine. The plans of the new opera-house hold out the expectation that in the matter of entrances, public and special staircases, vestibules, lobbies and corridors, the new theatre will surpass any now in existence. The Emperor's entrance has a covered arcade, so that the Imperial carriages may set down under shelter, in fact almost within the house itself.

#### ADULT EDUCATION IN FRANCE.

The subject of adult education has received great attention of late, and a circular, addressed by the Minister of Public Instruction to the prefects, puts us in possession of the facts connected with the movement.

It appears that between November and March last nearly 25,000 courses of instruction for adults were given in France; that the number of persons who attended them amounted to about 600,000; and that the teachers numbered 30,000 of all classes, male and female. The Minister says that by these means 250,000 illiterate persons have learned to read, write, and cipher.

Out of the 600,000 persons attending the classes, 117,000 paid for their instruction, altogether, 415,000 francs (£16,600); while 15,375 courses of instruction were entirely gratuitous, and 14,409 teachers gave their services without remuneration. The expenses have been met by subscriptions from 3,500 communes—about the tenth of the whole of France—amounting in the whole to 650,000 francs (£26,000); from private individuals, 125,000 francs; from the conseils-généraux, 72,000 francs; and by disbursements by teachers themselves for the same object, 91,000 francs; making a gross sum of nearly forty thousand pounds.

The teaching of adults, says the Minister, is now established in France, but no one can think for a moment of allowing teachers to continue double their labours without remuneration, and to put themselves to expense besides. The sum originally devoted by the government for adult education was 60,000 francs; this was raised to 110,000 francs for the present year, and will be increased to 150,000 francs for 1867. But this will fall far below the required amount, and therefore the Minister calls upon the communes to defray the expenses of fire and lighting, and to find means for the payment of the teachers when the courses are gratuitous. The adult classes, adds the Minister, double the number of schools with almost no cost; they render fruitful the outlay for primary education, thus drawing from the same capital double interest. There is no doubt that the conseils-généraux and other local bodies will answer the appeal made by the Minister; and if the work of adult education is pushed on with zeal for a few years the position of France as regards education will be materially altered.

#### PUBLIC MONUMENTS IN BELGIUM.

The Belgian authorities exhibit a most praiseworthy regard for their public works of art and monuments. A central commission is entrusted with their keeping and also with the consideration of all questions, theoretical as well as practical, touching their preservation. The report of the proceedings of this commission, embracing rather more than twelvemonths' labour, has recently appeared, and deserves attention.

It appears that the commission has more than twelve hundred subjects before them; that the project for the

restoration of public works presented to them included nearly two hundred; and that the works undertaken in consequence absorbed nearly £120,000. In addition to this the commission had to examine more than two hundred other projects for new buildings, and a still larger sum was expended on that account. The funds to meet these expenses were contributed partly by the Government and partly by local authorities.

The report refers to the efforts made by the commission to clear away all buildings abutting on churches, as a precautionary measure, as well as in the interest of art. It was found on inspection that the inhabitants were in the habit of cutting away buttresses, undermining walls, and injuring foundations by the sinking of wells.

Under the head of the decoration of religious edifices the report mentions the discovery in many churches of old mural paintings, covered up for long years beneath coats of paint or whitewash. Extensive decorations are proposed to be executed in old buildings; and amongst others the church of St. Jacques-sur-Caudenberg is to be commenced next year. Amongst other useful services done or proposed to be done, are the creation of a special atelier, under the auspices of the Government, for the restoration of ancient paintings, the formation of a complete catalogue of the works of art existing in public buildings, and the repair of the old gates of the town of Antwerp.

An interesting portion of the report is that which records the discussion by the members of the commission of several important questions submitted to it by provincial committees in communication with the central body. The Committee of Brabant proposed, first, that every artist submitting a plan for the restoration of a public monument should be required at the same time to furnish a memoir in support of his proposal; and, secondly, that in the case of new buildings the commission should confine itself solely to the consideration of the estimates and the solidity of the construction, leaving the entire responsibility, in an artistic point of view, with the artist himself. It is not surprising that the novelty of the propositions should have met with considerable opposition, and that the opinion of the majority was averse to both; it being argued against the latter that the commission, in renouncing all control over the esthetic value of the plan submitted to it, would be giving up its most important prerogative. It should be mentioned that the commission is only empowered to discuss the subjects submitted to it, the decision being left to the Government.

Another proposition was that a series of general instructions should be drawn up on the restoration and preservation of public monuments, and transmitted to all the administrations charged with such duties. This subject was discussed at length. One member considered that the reproduction of the very complete instructions published in France by the Committee of Monuments would be all sufficient. In opposition to this it was argued that Belgium was in a peculiar archaeological position; that she was, as it were, at the confluence of various styles, and the restoration of many of her monuments would present many points which had not been provided for in the French instructions; that many excellent architects were not archaeologists; and it would be useful therefore to establish certain general rules for the restoration of monuments in different styles; the architect who planned a new building should be left absolutely free, but it was not so when the restoration of an ancient monument was in question; in such a case his duty was to conform rigorously to the idea of the author of the work. The opponents of the proposition argued that architects were already far too much trammeled, and that, with the exception of the material parts of the construction, no general rules could be laid down. The only useful instructions would be such as were given to the architect in each individual case. On the other hand it was urged that the intention of the

proposal was not to interfere with the independence of architects. The instructions would not be for them alone but for local administrations, for ecclesiastical authorities, and for all those who are occupied, directly or indirectly, with the preservation and restoration of public monuments.

A proposal was made for the establishment of a central school of architecture at Brussels, but it was opposed upon the ground that such a measure would tend to diminish the attention paid to architecture in the academies, and to centralize the study. Other members of the commission, on the contrary, agreed with what had recently been done in France on this head, and supported the proposition as tending to strengthen architectural teaching, which in the academies was very incomplete.

Several questions set down for discussion on the programme of the commission itself were of general interest. The first was:—Whether, in order to preserve archaeological traditions in all their purity, a distinction should be drawn in certain cases between ancient monuments and additions which have been made to them at various times. It was stated, in a memorandum attached to the question, that the new portions of buildings erected in past ages, were distinguished from the older parts, in consequence of the general practice of completing an edifice in the style in use at the time of such additions, without consideration of the original style of the building. This statement was contested, and instances were quoted in which the new portions of ancient buildings had been built in the style of the original epoch. The result of the discussion was to draw forth an admission that the statement appended to the question had been couched in terms too absolute, and that certainly if, in past times, architects entrusted with the completion or extension of buildings conformed to the original style, such practice was quite exceptional; in far the greater number of cases, the new constructor took no heed of the older parts.

Another question set down for consideration was—in what case may an artist, in decorating a mediæval edifice, either by painting or sculpture, give to his figures costumes differing from those of the epoch to which the edifice belonged? It was asserted, on the one hand, that the figures might be dressed in the costumes which they really wore; and, on the other, that the costumes should be those of the time of the erection of the edifice, no matter when the persons represented may have lived. The commission, however, adopted the following view of the case:—That there were distinctions to be made as to the course to be taken, which could not be stated in absolute terms; when the work to be done was the addition of new to ancient statues, in order to complete the sculptural decoration of an edifice, it was the duty of the artist to reproduce even the anachronisms committed by the ancient artists, but that in the case of edifices having no sculpture, or of new buildings, the costumes adopted should be those of the time in which the personages lived.

The fourth question set down for consideration had reference to the duty of the Government as regards the preservation of private houses presenting a public interest, either in an artistic or historical point of view; but as the Belgian Government had already taken the initiative in this matter, the subject was allowed to drop.

The remaining question was whether an architect entrusted with the restoration of a building should be specially remunerated for drawings of the building in its former condition, in order that the State might become possessed of such drawings, which might be engraved and published on a uniform plan. This interesting subject was, however, adjourned to next year.

The discussion of subjects touching so intimately the preservation of the edifices and works of art of past ages shows how lively is the archaeological sentiment in Belgium.

## Fine Arts.

THE LOUVRE.—Visitors to Paris this autumn and during the year of the International Exhibition will find remarkable changes in the Louvre; several new galleries have been opened, or are now under the hands of workmen or decorators, and some will be opened to the public in a short time. One of the principal departments of the museum, that of Antiquities, is being completely renovated. M. Balze is entrusted with the work of restoring the frescoes, painted by Romanelli, in 1660, which decorate four of the salons of this portion of the gallery. In a fifth salon of the same department—that known as the Salon of the Emperors—another artist, M. Matout, is painting the ceiling, which is upwards of fifty feet long; and M. Biennoury is decorating the vaultings with paintings in cameo. A new and very fine room is now being finished in the new portion of the building, the Pavillon Denon, which will form a new and very convenient entrance to the museum; it is being decorated with paintings and sculpture, and will form one of the richest salons in the whole gallery. It will contain the great works of the old masters of the French school:—Lebrun, Lesueur, Poussin, and Jouvenet. When the Salle des Etats, now being constructed in that end of the grand gallery which connects the Louvre with the Tuilleries is completed, the chamber used at present for the meeting of the Emperor and the two legislative chambers, will be added to the long range of galleries occupied by paintings. The great vase of Amathoute has been placed in the gallery of Egyptian Antiquities, to which, although it gives additional interest, it adds nothing in appearance; its huge dimensions and great antiquity form its claims to attention. The Gallery of the Sovereigns is being enriched with some curious specimens of painted glass, principally Swiss; and the Gallery of Ancient Terracottas has received some additions. Great progress has also been made in the series of annotated and illustrated catalogues of the special sections of the Museum, which add much to its educational value. The Louvre will be seen in 1867 in a condition worthy of the occasion.

THE TRIBULATIONS OF A STATUE.—In the year 1827 the French sculptor, David d'Angers, presented the Government of Athens with a statue for the tomb of the hero of the war of Greek independence, Marco Botzaris. The figure was intended as an impersonation of regenerated Greece. A young girl, half reclining upon the marble, points to the name of the fallen hero. Almost immediately after the statue was placed on the tomb it was sadly mutilated by a group of bandits, under the command of a man who, during the war, had been a rival of Marco Botzaris. The vandals fired upon the tomb until they had succeeded in knocking off the feet, hands, ears, and some portions of the drapery. The statue remained in this terribly dilapidated condition until the year 1863, when it was sent to Paris by the Greek Government, who requested the family of the famous sculptor to have it restored with all possible skill. David d'Angers has left a son, if not more than one, but his art has not descended upon his children; therefore M. Allasseur, his most distinguished pupil, was selected for the task of restoration, which he is said to have performed with great skill. The work has been completed for some time, but, from some unexplained cause, instead of being replaced on the tomb of the hero, the statue still remains in Paris. The late political changes in Athens may have placed some difficulty in the way; but it is not to be supposed that the Government of Athens will allow the record of Greek independence, now that the work of the Vandals has been repaired, to remain long in the French capital.

## Manufactures.

**CHINA GRASS.**—The fibres of varieties of this nettle plant vary considerably in strength and fineness, growing generally to eight feet or more in length, according to climate and soil. They are capable of being easily cleansed from loose vegetable matters, so as to produce long filaments, which, for fabrics requiring excessive strength, would be much superior to flax or hemp. In comparison with those fibres, however, in the same state of preparation, the filaments are rough and coarse, consequently less adapted for light uses. Its highest value is attained in state of separated cells, varying from three to eighteen inches in length, of surprising wiry toughness and brilliancy when properly cleansed and uninjured by preparation; of good colour, requiring little or no bleaching. In this state it has now come into acknowledged use, although as presented on the market the fibre is much impaired and imperfect. As it is in appearance, fineness, and length very similar to mohair and lustre wools, it seems well adapted for mixing with them, or for forming warps for lustre wefts. For mixing with silk fibres its utility is now doubtful, as it is much coarser and stiffer; yet, as a weft yarn for silk warps it appears adapted to form cloths of great beauty. Nor need want of colour be here a drawback, as it is capable of being dyed in apparently permanent colours of a full rich red, violet, and blue. There is little doubt that, from the fibre so separated, European manufacturers could produce cloth exceeding in fineness and evenness, and consequently in beauty and brilliancy, the famed grass cloths of China. These cloths might not be so fine, nor could they be more brilliant, than a flax cambric can be produced, but they would possess a glassy stiffness (so opposed to the tendency of flax to become liny) which would command for them a high appreciation and value. The use of China grass in this state for fancy trimming is apparent, as well as for many fabrics for ladies' dress, and for some upholstery cloths, probably; also for superior fancy drills, it would produce goods highly appreciated on the Continent and in warm climates. It is noticeable that in separating this fibre, the lustrous coat of each cell is so thick that when the outer portion of it (which is organic) is left intact, with all its natural brilliancy, the cell is perceptibly thicker, even to the naked eye, than it is as usually treated with this outer coat destroyed. It is attacked with unusual facility, as is also the strength of the cell. The samples of this combed fibre at present found in commerce do not possess more than from one-third to two-thirds of their natural strength or length. But although the difficulty in preserving these is considerable, yet the total difficulties to be surmounted in bringing the fibre into this state are not so great as in most other fibres, and by the employment of reasonable means the cells may be obtained nearly of their natural length, strength, and brilliancy, accompanied with perfect separation. The relative actual value of China grass is high. Its present quoted price of £85 per ton may be called a fancy one. The trade cannot give it, and will not do so long, when it is producible with equal profit at as low a price as Bombay hemp itself. It is a forcible instance of the heavy *vis inertia* which hangs over everything not hackneyed in commerce, that such a valuable fibre, producible at so low a rate, and in illimitable quantities, should be so difficult to obtain, and at prices so fabulous; for the fibre, even if simply cleansed (by means within the reach of every one) for a strong rope, or coarse cloth filament, would be a valuable adjunct to our fibrous materials, in increasing demand at remunerative rates to the producer.

**PAPER MANUFACTURE.**—The value of the paper made in the United States in 1850 was £2,000,000, and in 1860 was £3,500,000; the value of books printed in 1860 was £2,370,000, and of newspapers, £4,130,000.

**SUGAR IN NORTH AMERICA.**—The cane sugar made is

about 300,000 hds. of 1,000 lbs. each, and molasses 17,000 gallons. Of maple sugar about 40 million pounds are made, and about 2 million gallons of molasses; of Sorghum molasses about 8 million gallons are made; of honey, 26 million pounds are obtained.

**IRONFOUNDING.**—The value of the iron made in the United States in 1860 was 28½ million dollars, against 20 million dollars in 1850.

**AMERICAN MANUFACTURES.**—The value of the leading manufactures in 1860 was in round numbers as follows, in dollars:—Cotton goods, 115 millions; boots and shoes, 90 millions; leather, 72 millions; clothing, 70 millions; woollen goods, 69 millions; machinery and steam-engines, 47 millions; sugar refining, 38½ millions; iron-foundering, 28½ millions; bar and other rolled iron, 22 millions; pig-iron, 19½ millions; cabinet furniture 24 millions; malt liquors, 18 millions; agricultural implements, 18 millions; soap and candles, 17 millions.

## Commerce.

**AMERICAN COAL.**—The quantity of coal produced in the United States in 1860 was 15,551,000 tons, of which 9,416,340 was anthracite, and 6,134,660 bituminous. Pennsylvania produced 45·8 per cent. of the quantity of bituminous coal.

**SPANISH WOOL.**—Our imports of sheep's wool from Spain have been gradually decreasing. In 1860 we received over one million pounds, and last year but 115,611 lbs.

**RICE IN AMERICA.**—Sir S. Morton Peto, in his work on the resources and prospects of America, says:—"The cultivation of rice is limited to a very few slave states. South Carolina and Georgia produced in 1860, 171,000,000 lbs. out of the total produce of all the States, which amounted to 187,000,000 lbs. In 1820, South Carolina and Georgia produced 198,881,000 lbs., and the total product of the States in that year exceeded 215,000,000 lbs. Rice, therefore, which in America is a product peculiar to the slave states, is a declining cultivation."

**TEA CULTURE IN INDIA.**—Some efforts have recently been made (say Messrs. Travers) by the Government of India to procure information on the subject of tea-culture from the planters themselves; and though the attempt has not been wholly unsuccessful, it is disappointing to find that these efforts have not been seconded by a corresponding readiness in the planters to afford the necessary returns. The Government of Bengal, anxious to include in the Annual Administration report some reliable information on the cultivation of tea in Assam and Cachar, had given instructions to the commissioners of the districts in question to furnish an annual report on this particular article. Blank forms were accordingly printed, to be filled up with the names of the tea-gardens, the extent of the land under cultivation, the out-turn of tea in the present and past seasons, the relative proportion of European and native assistants, the average monthly number of labourers employed during the year—men, women, and children—with any remarks having relation to the out-turn or any other subjects connected with the return. With complete answers to these queries the actual state of the cultivation would be realised at once. The planters, however, appear to have regarded the inquiry as an arbitrary and inquisitorial proceeding on the part of the Government, and in many instances actually refused to make the required return. In the Seesagur district alone, out of 139 proprietors of tea estates who were asked to fill in the forms, only twenty complied with the request; and one of the managers, the commissioner reports, sent back his returns, stating that "he had no time for such matters." In the Nowgong and Durrung districts, either the information given was of so meagre a character as to be practically useless, or the planters declined to answer. The only three places where anything

like accurate information was obtained, was Gowalpara, Kamroop, and Luckimpore. When an inquiry of a similar character was attempted to be made some time previously, the unwillingness of the planters to afford information was explained on the ground of their "often having no paper on which to make their returns, and partly because they were not prepared to incur the expense of the postage incidental to their transmission." It was for the express purpose of meeting these objections that blank forms were prepared, together with a franked envelope, in which they were to be returned after being filled in. However, even this plan has been found to be quite as unsuccessful as the former, and the commissioner, in his report to the Government of Bengal, asserts that even "fewer returns have been made this year than last year." "I believe," he adds, "that the reason is to be found in the altered conditions under which tea planting is now carried on in Assam; it is not alone the production of tea which is concerned, but the success of very extensive financial speculations which might be injuriously affected in many instances by disclosures." Under these circumstances the Government refers the matter to the Landholders and Commercial Association for their consideration; but their answer, whilst admitting the great public utility of such inquiries, appears to insist on the redress of some special grievances before they will concur with the Government in the proposed inquiry.

**BEET SUGAR AND CANE SUGAR.**—The following is from *Travers' Circular*:—The astonishing progress made in late years by beetroot sugar is beginning to excite the greatest apprehension in the sugar growing colonies. It is of the greatest interest to consider the different points that are likely to cause the preponderance of the cane or of the beet. In the first place, the sugar cane is a denizen of the tropics, where the condition of the weather at any given time can be counted upon with certainty. The beet, on the other hand, grows in the temperate zone, where, although the inhabitants neither suffer from excessive heat nor excessive cold, the weather is almost always unsettled and more or less uncertain. The beet, which is affected by too much rain or by too little, by unseasonable heat, by unexpected cold, or by too little or too much sunlight, is particularly uncertain in its growth, and the remarkable fluctuations in the crops during the last few years sufficiently establish this point. In 1859-60 the beet crop amounted to 438,000 tons; in 1860-61 it amounted to only 366,826 tons; in 1861-62 it again rose to 404,411 tons; and in 1862-63 to 450,000 tons. The season 1863-64 was a bad one, and the return sank to 385,741 tons, from which it again rose in 1864-65 to 475,000 tons. This season it will probably amount to close on 600,000 tons. It must be remembered, in considering these very great fluctuations in returns, that, notwithstanding the extraordinary variation in yield, the breadth of land sown has steadily increased year by year, and that even the present season (the largest known) has been a favourable one only in France, while in Germany the weather was decidedly unfavourable, and in Russia so much so as to cause a failure of the crop. Although the beet crops will probably continue to increase, and although in a generally favourable season much heavier returns may be looked for, there is certainly some comfort for cane planters in the fact of the great uncertainty of the European plant. The beet owes its rapid spread over the Continent, in great measure, to its indirect use in agriculture. It gives a basis for the rotation of crops; its leaves and refuse are useful for cattle feeding and for manure. But, on the other hand, the indirect uses of the cane have never been tried, and its refuse, although full of saccharine matter, far from being made useful, is burnt. There is another advantage possessed by the beet in its being produced in the very countries where the sugar is wanted—thus saving the costly freight from the tropics. This certainly applies to countries in the interior of Europe, but countries having a seaboard, and which

have to draw their supplies from the interior or from other European kingdoms, can frequently import sugar at nearly as cheap a rate as they can transport it. For instance, the latest quotations of freight from Mauritius to England is 30s. per ton, while to get sugar even from the north of France to London costs 25s. per ton; or, in other words, the carriage of sugar from Mauritius to England is only 3d. per cwt. dearer than from France to England. Thus, as far as freight is concerned, there is little fear, while the English market remains open, of cane sugar being shut out from consumption. It must, however, be expected, if the present state of things continue, that in a very few years the Continent will draw its supplies entirely from the beet, and also, that although England has as yet made no sugar from it, that the beetroot grows and thrives from John o' Groat's to the Land's End, and that a little more success on the Continent will cause the manufacture of native sugar to be introduced here. It remains to be seen whether cane sugar can recover the ground lost, but there can be little doubt, had proper use been made of their advantages, that the colonial planters would not have been so far behind in the race as they are at present. The scale of duties meant to protect certain colonies against the effect of their ignorance and wastefulness, had the effect of lowering the standard of sugar-making all through the tropics. Instead of trying to make the finest possible sugar, the planter tried to make the worst, and the wasteful process that had existed in only a portion of the colonies became general. In the meantime the ablest chemists, engineers, and agriculturists were silently studying the constitution of the beetroot. Every invention that could increase the saccharine yield of the root, facilitate its working, and improve the quality of the sugar, was eagerly applied; the yield of sugar from a given quantity of beetroot has been doubled in ten years, and white sugar can now be made in France at the first operation as cheaply as brown. Should such progress induce cane planters to despair? On the contrary, it should stimulate them to exertion. Surely if the cane contain twice as much saccharine matter as the beet; if it be far more easily worked; if its growth can be more confidently relied on; if its molasses be a saleable article, which is not the case with the beet, surely we say that, far from despair, the feeling that should animate the planters should be that of hope that the proper appliances may yet rescue their industry from ruin. Every year that passes shows more indisputably the necessity for improving cultivation, for improving machinery, and for making the best instead of the worst sugar; and if cane planters will take advantage of their opportunity they may yet retrieve their position.

### Colonies.

**SALMON IN AUSTRALIA.**—The *Times* correspondent at Melbourne, in a letter dated May 28th, says:—"The salmon has often been called "the king of fish," and certainly in Australia he receives right regal honours. For many days before the arrival of the *Lincolnshire* with the last consignment of salmon and trout ova, the vessel was anxiously looked for by our Acclimatization Society. The Victorian steam sloop *Victoria* had been engaged weeks before for the carriage of the ova to Tasmania for deposit in the breeding ponds in the neighbourhood of Hobart Town. When the *Lincolnshire* did arrive in our bay, it was not long before our Salmonians were on board of her in force. The transhipment from the *Lincolnshire* into the *Victoria* took place on the 5th inst. It was a very solemn proceeding. As great officers of state may assemble in an ante-room on the birth of a Crown Prince, so the President of our Acclimatization Society, supported by a number of his fellows, superintended the interesting work. So admirable a provision for the safe carriage of the ova had

been made in the *Lincolnshire* that in a few of the boxes which were opened at least 80 per cent. were alive, and Mr. Ramsbottom, who is in charge of the shipment, confidently expects that 60 per cent. of the whole will be safely deposited in the breeding ponds. There were 140 boxes in all. We have since learnt from the Tasmanian newspapers that the precious shipment was received with at least equal honours and attention on the other side of the Straits, and, in the presence of various Government officers and enthusiastic naturalists, was landed, carefully carried to its destination, and finally consigned to the hatching boxes. The latest intelligence is that the ova had commenced hatching, and Mr. Ramsbottom pronounces this last shipment to be 'a great success.' Our acclimatizers deserve this success, for their hearts, stomachs, and pockets have been in this business for years. We are now beginning to look for the return of our earlier lots of young salmon from the sea to the river in which they were bred. Until the crowning results shall be distinctly ascertained we can hardly believe that salmon are perfectly naturalised in these regions, or that they are literally 'too many' and too active for the sharks and other natural enemies which are doubtless quite ready to welcome in their own way the new addition to our seas."

**SOUTH AUSTRALIA.**—The population of this colony is now nearly 165,000. The agricultural statistics show a great falling off in the produce of last harvest, chiefly owing to drought. It, however, is beneficial to see that during the present month much more than the average quantity of rain fell, and this has greatly revived the hopes of all those who occupy or cultivate the land. Mining operations continue thriving, and there are indications not far distant of new discoveries both in copper and gold.

**STATUE OF THE PRINCE CONSORT AT SYDNEY.**—On the 23rd April the statue to the memory of the Prince Consort was inaugurated. The crowd who witnessed the ceremony formed the greatest demonstration that has ever taken place in the Australian colonies. St. George's day had not previously been devoted by unanimous consent to relaxation from business, but was on this occasion observed as a close holiday. The meeting was not one of representatives—it was a gathering of the people, rich and poor, literate and unlearned, to do honour to the memory of a prince who was the friend of all classes.

**NEW ZEALAND FLAX.**—Many efforts have been made to render this a marketable article for export, but the difficulty has always been the removal of the gum from the fibre. A Sydney paper says that if the green leaves are boiled for about two hours in water mixed with a little manure from a cowshed the gum is completely absorbed, so that on washing in cold water the fibre is left clean and white. No damage appears to be done to the fibre by the process, which, of course, is one that can be put in practice by every settler's family up the country.

### Notes.

**THE PRINTING TRADE AND THE FACTORY ACT.**—It appears from the report of the Children's Employment Commissioners, recently issued, that there are in England 30,171 male, and 419 female, persons coming under the designation of "printers," and in Scotland 4,400 males and 70 females. Of the total of 30,590 so employed in England, 2,819 are under fifteen years of age; and of the total of 4,470 employed in Scotland, 593 are under that age. It is remarked in the report that over-crowded, ill-ventilated, dirty, and unhealthy composing-rooms, reading-closets, and machine-rooms, make up what is designated a printing-office. The excessive amount of overtime and nightwork are strongly spoken of in the report, and instances are given of boys between ten and thirteen years working thirteen hours and more

at a stretch. The injurious effect of such work on the health is pointed out, and the report goes on to state that it appears that the following classes of persons are responsible for such a state of things:—"Editors of, and writers of articles in, magazines, weekly newspapers, and other weekly or monthly periodicals, who will not send in their contributions until the last moment. Cases are mentioned of editors not having in the evening completed the writing of articles for magazines that are to be printed off, bound and circulated the next day; railway officials, and other persons requiring guide-books, hand-bills, or other notices to be printed by a given day, who withhold their instructions until the evening before the day on which the printed matter is wanted; solicitors who send matter at six or seven o'clock in the evening which is wanted by nine o'clock the next morning; those who direct the publication of certain parliamentary documents, such as the votes, evidence taken before committees, and other matter requiring to be put into print by the next day." The Commissioners express the opinion that none of the excuses made for this state of things are of sufficient weight to induce the legislature to abstain from granting to the young and to females the valuable boon of the regulated hours of factory labour.

**THE CYCLOSCOPE.**—At a meeting of the Institution of Civil Engineers, on the 15th May, Mr. H. Temple Humphreys, Assoc. Inst. C.E., exhibited and explained, with diagrams, an instrument called the cycloscope, for setting out railway or other curves without the aid of the transit theodolite, &c. Externally, it somewhat resembles a box sextant. It was composed of two essential parts only, viz., two plane mirrors, one of which was silvered over the whole of its surface, and the other over one-half of its surface. By a law of physical optics, which was called either combined or successive reflections, a series of images would be formed in the half-mirror, which were rendered available to set out any curve of any given radius, by applying the eye to an eye-hole in the back of the whole mirror, and at the same time setting the two mirrors at an angle to one another, equal to the required tangential angle. Then the several successive reflected images of a ranging rod, for instance, were seen to lie upon the circumference of a mathematically true circle. The curve was then readily set out in the field by simply placing other ranging rods in line with these several images. This could be done by looking through the unsilvered half of the half mirror, and planting the rods opposite to and overlapping the successive reflections. No error could arise in the manipulation, and the whole process of setting out a true curve was shortened and simplified. After setting the mirrors to the requisite tangential angle, no further adjustment or support was needed than could be afforded by the top of a ranging rod placed at the commencement of the curve, and shifted occasionally to any stake on the curve that the limits of distinct vision might require.

**THE CEMETERIES OF PARIS.**—The excellent regulation which prohibits the maintenance of burial places, as well as of abattoirs and cattle markets, within the boundaries of the city, has been broken through in the one case as in the other by the extension of the limits of the capital; the great cemeteries of Père la Chaise, Montmartre, and Mont Parnasse, like the old abattoirs, are all now within Paris. This infringement of a salutary rule will not, however, be of long duration; the municipal government of Paris is occupied with the subject, and before long, with the exception probably of family vaults, no funerals will take place within the walls or rather the fortifications which now fill the place of the ancient boundary. A large tract of poor land has been purchased in the neighbourhood of Pontoise, a small town in the department of the Seine-et-Oise, and distant about twenty miles from Paris, on the Northern Railway, for the new cemetery, and it is proposed, or at any rate under consideration, to make a special railway to be

devoted exclusively for the service of the cemetery. It is not stated whether there will be burial places created in other places as well as that referred to, but this seems probable, for otherwise the funerals would have to be conducted over a long distance. There are, however, local cemeteries in all the outskirts of the city, beyond the fortifications, and these will probably be made available for the use of the inhabitants of Paris in their vicinity. The transfer of the chief cemetery to a distance from Paris will interfere in some measure with an ancient custom of the people, who, on All Saints Day and the day following, the Jour des Morts, visit the graves of the departed and decorate them with emblems of regret and affection.

### PARLIAMENTARY REPORTS.

#### SESSIONAL PRINTED PAPERS.

*Delivered on 18th July, 1866.*

Par.  
Numb.  
202. (B.) Bills—Public Health (Amendment.)  
211. , " Commons (Metropolis) (amended.)  
392. Education—Report.

*Delivered on 19th July, 1866.*

206. (B.) Bills—Public Health (amendments by Mr. Walpole) (corrected Copy.)  
210. , " Hares and Rabbits (Scotland.)  
212. , " Public Schools.  
213. , " Tramways (Ireland) Acts Amendment (amended by Select Committee.)  
214. , " Overseer of the Poor (small Parishes)  
215. , " Colonial Branch Mints.  
216. , " Drainage and Improvement of Lands Act (Ireland) (Provisional Order.)  
217. , " Courts of Justice.  
218. , " Public Works, Harbours, &c.  
219. , " Public Works Loan (Ireland.)  
220. , " Railways (Ireland) Temporary Advances.  
393. , " Navy (Turret Ships)—Correspondence.  
National Education (Ireland)—Thirty-second Report.

*Delivered on 20th July, 1866.*

221. Bills—Poor Law Amendment.  
222. Parochial Buildings (Scotland) Act Amendment.  
386. Writs Registration (Scotland) Bill—Report and Evidence.  
396. Mines—Returns.  
399. Civil Services—Supplementary Estimate.  
403. Chamber of London—Annual Accounts.  
407. National Education (Ireland)—Rule.  
414. Navy—Supplementary Estimate for increased pay to Medical Officers.  
415. Navy—Supplementary Estimate (Ship on the design of Captain Coles.)  
416. Navy—Supplementary Estimate (completion of Ship "Northumberland.")  
417. Railways (Ireland)—Treasury Minutes.  
426. Revenue Departments—Supplementary Estimate.  
Customs—Tenth Report of Commissioners.

*Delivered on 21st July, 1866.*

409. Cattle Diseases (Ireland) Act—Order in Council.  
413. British Museum—Communications.

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457. East India Army (Regimental Numbers)—Returns.

*Delivered on 23rd July, 1866.*

223. Bills—Fees (Public Departments.)  
226. , " Railway Construction Facilities Act (1864)—Amendment.  
229. , " Turnpike Acts Continuance.  
230. , " Glebe Lands (Scotland)—Lords Amendments.  
231. , " Naval Discipline.  
374. East India (Progress) Statement.  
391. Thames Navigation—Minutes of Evidence.  
402. Redundant List (Public Departments)—Return.  
405. Thames Conservancy—General Report.  
420. Small Pox in Sheep—Order.  
421. Cattle, &c. Importation (Netherlands)—Two Orders in Council.  
430. Queen's University (Ireland)—Patent granting Supplemental Charter.

*Delivered on 24th July, 1866.*

227. Bills—Traffic Regulation (Metropolis.)  
228. , " Turnpike Trusts Arrangements.  
232. , " Parishes (Scotland) Act (1848) Amendment.  
410. Friendly Societies (Scotland)—Quinquennial Report.  
442. (A.) Poor Rates and Pauperism—Return (A.)  
Public General Acts—Caps. 49 to 52.

### Patents.

*From Commissioners of Patents' Journal, July 20th.*

#### GRANTS OF PROVISIONAL PROTECTION.

Blinds and shutters—1796—A. Clark.  
Bobbins—1804—A. V. Newton.  
Bottles, filling and corking—1817—W. Thompson.  
Bricks—1770—D. Nichols and W. B. Leachman.  
Bricks, &c., burning and drying—1794—R. Kunstmann.  
Buoys, lighting—1651—A. Miroude.  
Coal into lumps, combining—1782—H. G. Fairburn.  
Coin, surfaces for disposing and picking up—1797—J. Murray, B. J. P. Webb.  
Cucumbers, slicing and paring—1801—W. Moseley.  
Envelopes—1795—P. Simard.  
Fibrous substances, preparing—1680—A. Lee.  
Fire-arms, breech-loading—1793—C. Harvey.  
Fire-arms, breech-loading—1810—W. J. Curtis.  
Furnaces—1789—J. A. Salmon.  
Gas pipes, fittings for—1776—J. Brotherton.  
Looking-glass presses—1800—P. J. Bellot, sen.  
Marine steam engines—1802—J. Elder.  
Neck-tie or scarf retainer—1807—G. Davies.  
Ordnance—1819—W. Hobbs.  
Painters' easels—1809—J. S. Cuthbert.  
Photographic printing frames—1788—L. Field.  
Plastic compounds—1798—F. Fried.  
Sewing machines—1784—W. Clark.  
Shafts, sinking—1784—J. D. Brunton.  
Ships, rig of—1400—C. Chapman.  
Shuttle tongues—1799—T. Ivers and J. Haddock.  
Steam boilers—1792—T. Lishman.  
Steam boilers—1811—J. Howard and E. T. Bousfield.  
Steam engines valves—1808—S. Clark.  
Stone, smoothing the surface of—1730—T. Smith.  
Stop valves—1787—W. Chesney.  
Taps and dies—1765—W. Adkins.  
Telegraph and signal posts—1803—W. Baines.  
Telegraph, transmitting messages by—1646—F. J. Bolton.  
Weaving, looms for—1790—C. Heptonstall.  
Weaving, looms for—1791—J. Monnier, C. D'Hondt, and J. Meurant.  
Weaving, looms for—1791—J. Monnier, C. D'Hondt, and J. Meurant.

#### INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

Railway trains, communication by signals between passengers, guards, and drivers of—1815—I. Gregory.  
Screw-bolts—1816—G. Haschline.

#### PATENTS SEALED.

203. T. Rowatt.	250. J. A. Castree.
218. T. Pridgeaux.	253. F. Wise.
220. W. Brookes.	268. W. Justice and E. Guild.
221. W. Hodgkinson.	284. A. Chapman.
227. E. Hopkins.	314. J. Mallison.
229. J. W. Evans.	319. J. B. Grant.
231. M. H. Lishman and E. Chambers.	411. W. N. Wynn.
233. E. Turney and J. Turney.	420. J. Davidson.
238. G. Hincliffe.	446. J. Patterson.
241. J. Jones.	1374. W. E. Newton.
243. W. Clark.	1391. J. W. Bartlett.
245. J. Souter.	1396. W. E. Newton.
	1397. G. Macdonald.

*From Commissioners of Patents' Journal, July 24th.*

#### PATENTS SEALED.

246. J. Piddington.	321. A. Murray.
249. G. Dyson.	344. R. Jobson.
265. H. Sherwood.	397. N. H. Felt.
266. J. Spencer.	427. J. G. Clarke.
270. J. Howden.	433. W. F. Cooke.
271. S. Cook & W. H. Hacking.	1091. J. G. Jones.
272. J. H. Brown.	1107. E. C. Nicholson.
274. W. W. Pocock.	1248. W. de la Rue.
281. J. Orr.	1366. G. A. Jasper.
305. H. A. Bonneville.	

#### PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

1803. A. Clark.	1962. J. J. A., & W. Thornton.
1830. W. Naylor.	1820. F. L. H. Danchell.
1854. B. Birnbaum.	1821. C. H. Roedkner.
1812. J. and W. H. Bailey.	1843. M. A. Soul.
1818. R. Weare.	1832. P. R. Jackson.
1828. R. A. Broomean.	1833. J. Ronald.

#### PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

1738. J. Gillott.

### Registered Designs.

An Improved Treble Elliptic Carriage Spring—July 14—4799—David Davies, St. Julian's Friars, Shrewsbury.